2023

CITY OF ASPEN BUILDING IQ powered by CORE

BENCHMARKING ANNUAL REPORT

LETTER FROM THE MAYOR

Dear Community Members,

Aspen, Colorado is intrinsically reliant on our natural surroundings and is committed to environmental progress and leadership. It is with great pride that I share this update on our city's plan to address a crucial facet of our environmental footprint - our built environment.

The numbers speak for themselves: 57% of Aspen's greenhouse gas emissions originate from our built environment, with commercial buildings accounting for over 60% of our energy consumption. It is imperative that we take concerted action to curb emissions from our structures to meet our climate action goals, conserve our natural resources, and save money.

Aspen City Council in 2022 passed Ordinance No. 5, known as Building IQ. Building IQ stands as the cornerstone of our strategy to reduce emissions resulting from our built environment. This innovative program operates through a phased, two-part approach: the first phase involves benchmarking, followed by the implementation of building performance standards (BPS).

The City of Aspen, along with the Community Office of Resource Efficiency (CORE), embarked on the first two years of benchmarking. We have successfully benchmarked our municipal buildings, as well as commercial properties exceeding 15,000 square feet in size. Benchmarking asks building owners to track their structures' energy and water usage over time establishing baseline data, which enables understanding how our buildings are performing and identifies areas for efficiency enhancements.

Through building performance standards we will seek to empower building owners to make informed decisions about improvements that will reduce energy usage and also lower utility bills, enhance comfort, and contribute significantly to our city's science-based targets for reducing greenhouse gas emissions.

Thank you for your commitment and support to our community's dedication to respecting and protecting our most valuable asset, our environment. We look forward to powerful partnerships that will achieve improved energy and resource efficiency, increase cost savings, and meet sustainable climate goals.

With the highest regards,

Torre
Aspen Mayor

EXECUTIVE SUMMARY

CORE and the City of Aspen developed the 2023 Benchmarking Annual Report to highlight the findings from Year Two of Aspen's benchmarking data in comparison to Year One. It also includes an analysis of energy and water use as it corresponds to different building types ranging from hotels to office buildings.

Benchmarking is a process that measures and compares a building's energy performance against similar structures, past consumption, or a predefined reference standard. Benchmarking not only enhances awareness about a building's energy and water use, it can identify areas of improvement and building performance standards that can lead to significant energy savings in the built environment.

Findings included in this report:

- Total number of buildings: 65
- Commercial Buildings, size 15,000 sq ft. and larger: 42
- City-Owned Buildings: 23
- Different Building Types: 24
- Total Square Footage: 2.8 million
- Average Energy Use Intensity (EUI): 138
- Average Water Use Intensity (WUI): 39

Benchmarking is a key component in helping Aspen reach its climate action goals to reduce greenhouse gas emissions by 63.4% by 2030 and 100% by 2050.

Year One: January 1, 2021 - December 31, 2021

Year Two: January 1, 2022 - December 31, 2022

On April 12, 2022, the City of Aspen passed Ordinance No. 05, officially establishing the Building IQ program. A benchmarking timeline was developed based on the size and type of building, and reporting is required annually on June 1st. [Building IQ]

More information about Aspen's benchmarking results can be found in the enclosed report. For questions about how to benchmark, contact CORE at energy@aspencore.org. For questions about the Building IQ policy, contact the City of Aspen at buildingiq@aspen.gov.

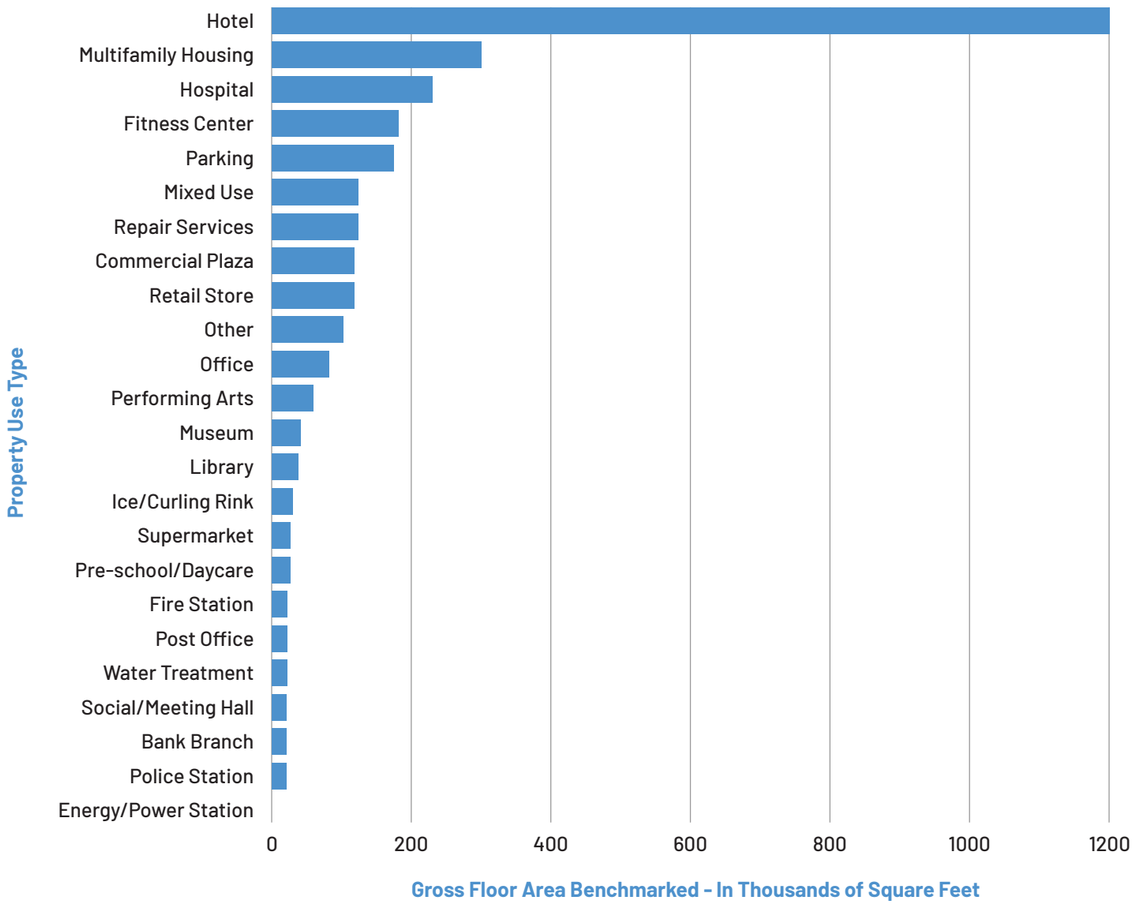
WHO IS BENCHMARKING?

In 2023, 65 buildings within Aspen City Limits were required to benchmark their energy and water use data, representing more than 2.8 million square feet of buildings. The three types of buildings that represent the largest square footage include hotels, hospitals, and multifamily buildings with a total of about 1.6 million in square footage (ENERGY STAR Portfolio Manager, 2022).

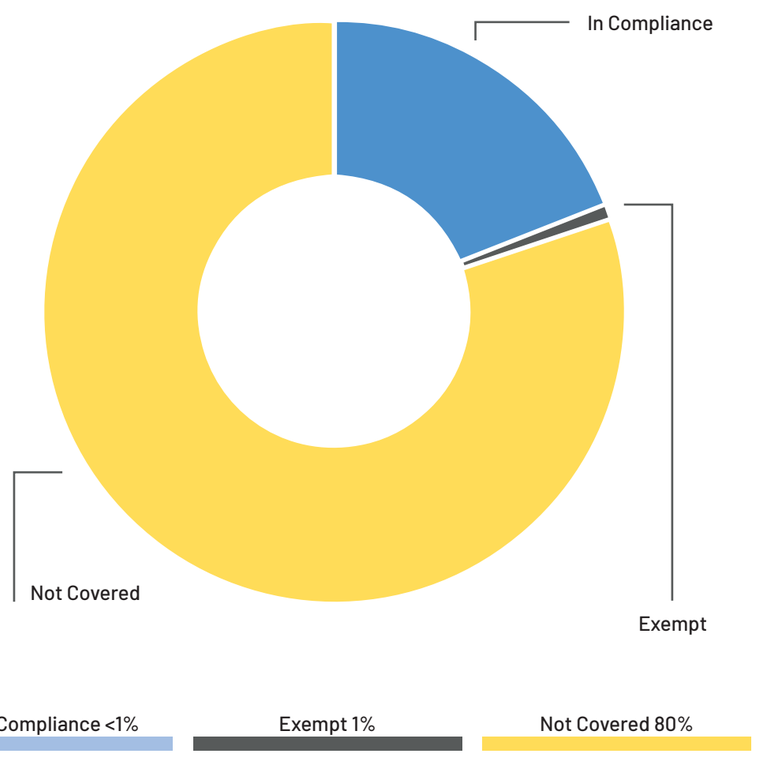
This graph shows the total gross floor area (in square feet) that was benchmarked in 2023, grouped by building use type.

Benchmarked Building Highlight

Aspen City Hall is a 37,000-square-foot, all-electric office building with a foundation built on energy efficiency. This includes receiving 100% renewable electricity from Aspen Utilities and using geothermal energy to transfer heat from the ground into the building during the winter and reverse the process in the summer. City Hall opened to the public in 2021 and has been benchmarking ever since.



This graph shows, as of 2023, how many buildings successfully complied with benchmarking requirements, how many exemptions were issued, how many buildings were not in compliance, and the remaining building stock that is not currently covered by benchmarking requirements.



GETTING SCIENTIFIC

To better understand energy usage, it's helpful to understand energy metrics.

kBtu =
One thousand (kilo) British thermal units.

A Btu is a measurement of thermal energy where one Btu is the energy needed to heat or cool one pound of water one degree Fahrenheit at sea level. So, assuming you're in a room that's set at 60°F and you're at sea level, it would take 1,216 Btus to bring a gallon of water to a boil. (ENERGY STAR)

EUI/WUI =
Energy Use Intensity/ Water Use Intensity

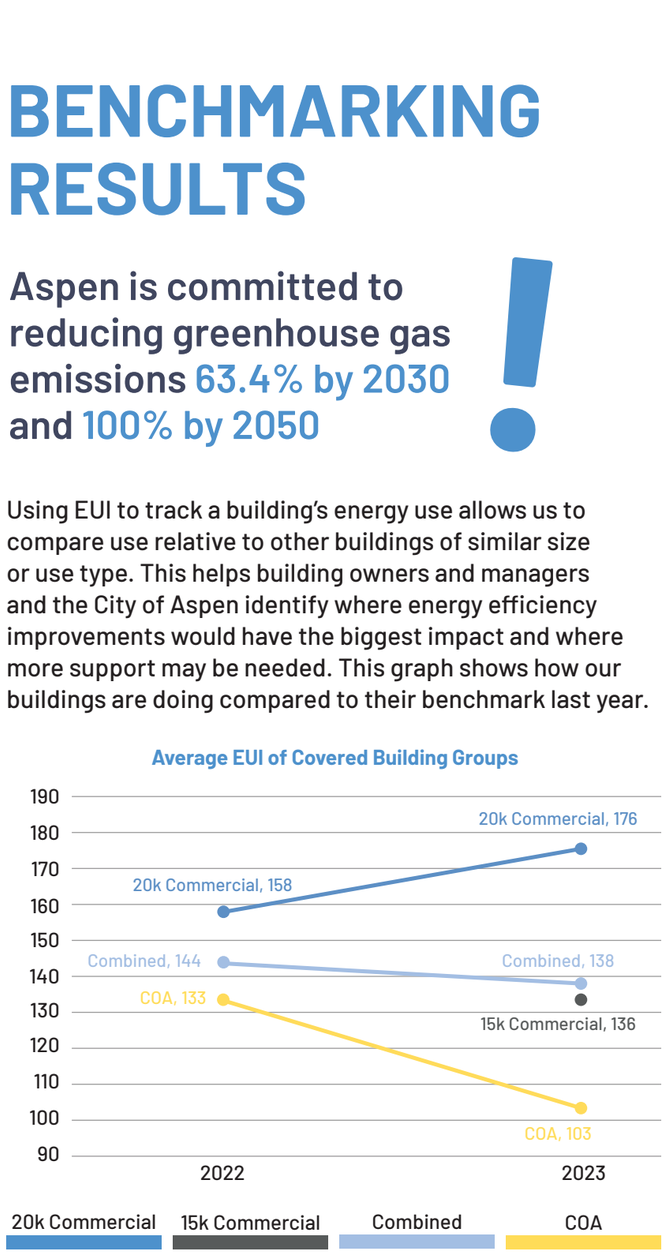
EUI/WUI refers to the amount of energy or water used per square foot annually. EUI/WUI is calculated by dividing the total energy or water consumed by the building in a year (kBtus or gallons) by the total gross floor area (square footage). (ENERGY STAR)

BENCHMARKING RESULTS

Aspen is committed to reducing greenhouse gas emissions 63.4% by 2030 and 100% by 2050

Using EUI to track a building's energy use allows us to compare use relative to other buildings of similar size or use type. This helps building owners and managers and the City of Aspen identify where energy efficiency improvements would have the biggest impact and where more support may be needed. This graph shows how our buildings are doing compared to their benchmark last year.

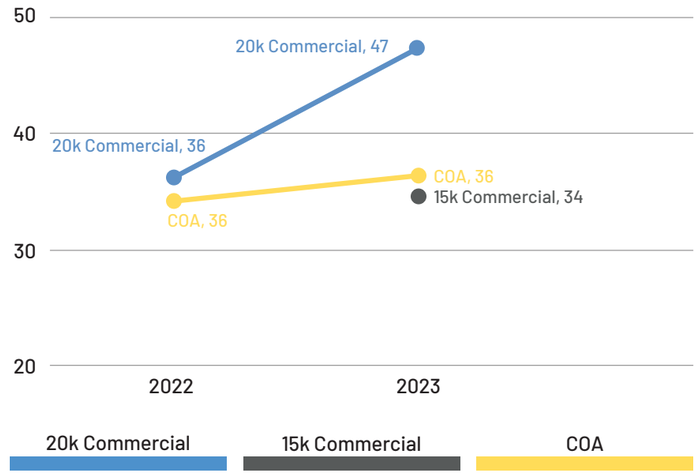
Average EUI of Covered Building Groups



Research shows that benchmarking alone can reduce energy consumption by 2-3% (Benchmarking and Energy Savings, 2012). If our three largest building sectors reduced their energy use by 3%, we could save 8.2 million kBtus per year. According to the Environmental Protection Agency (EPA), on average, each home in the United States consumed 82,126 kBtus of energy throughout 2019 (Gases Equivalencies Calculator). Using this metric, we can estimate that the energy saved from benchmarking alone could be used to power 100 homes.

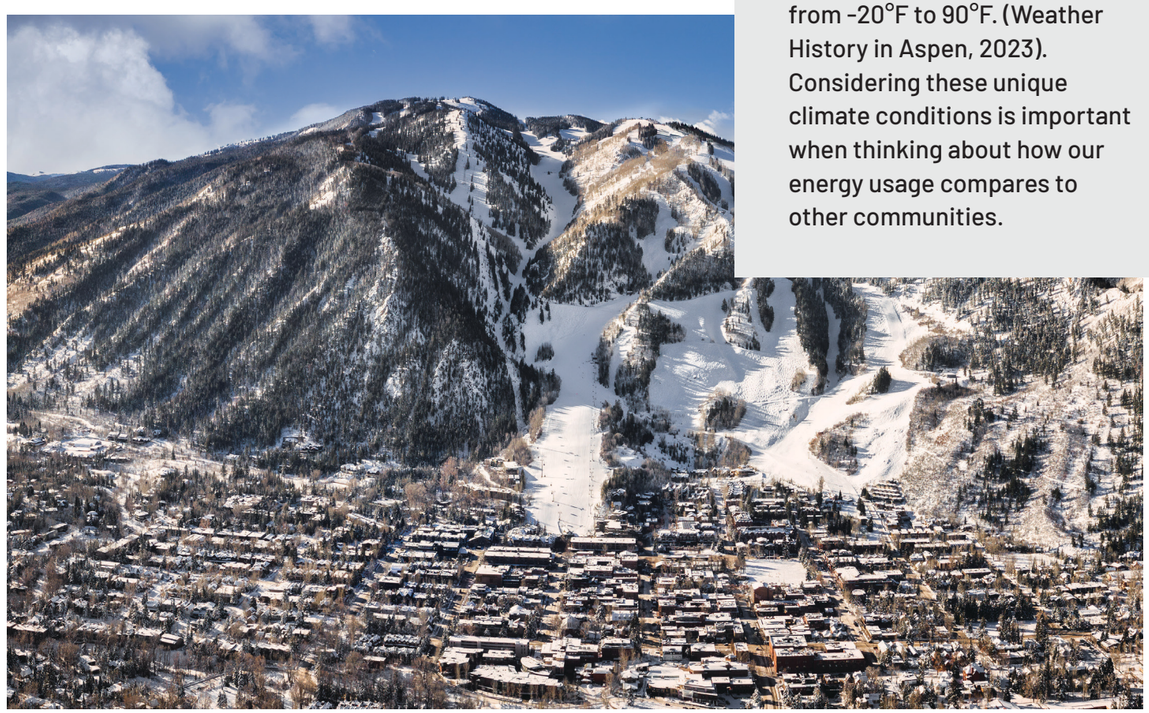
Water usage is another important metric of a building's performance. The City of Aspen collects and reports on WUI in the same way we do with energy. As more data becomes available from similar communities, we'll work with water experts to understand how our buildings compare and how they can improve. This will be an opportunity to collaborate with City of Aspen Utilities in support of their water efficiency plan.

Average WUI of Covered Building Groups



This graph shows how WUI in Aspen buildings changed compared to last year.

At our high elevation, the summers are sunny and dry, winters are freezing and snowy, and over the course of the year, temperatures can vary from -20°F to 90°F. (Weather History in Aspen, 2023). Considering these unique climate conditions is important when thinking about how our energy usage compares to other communities.



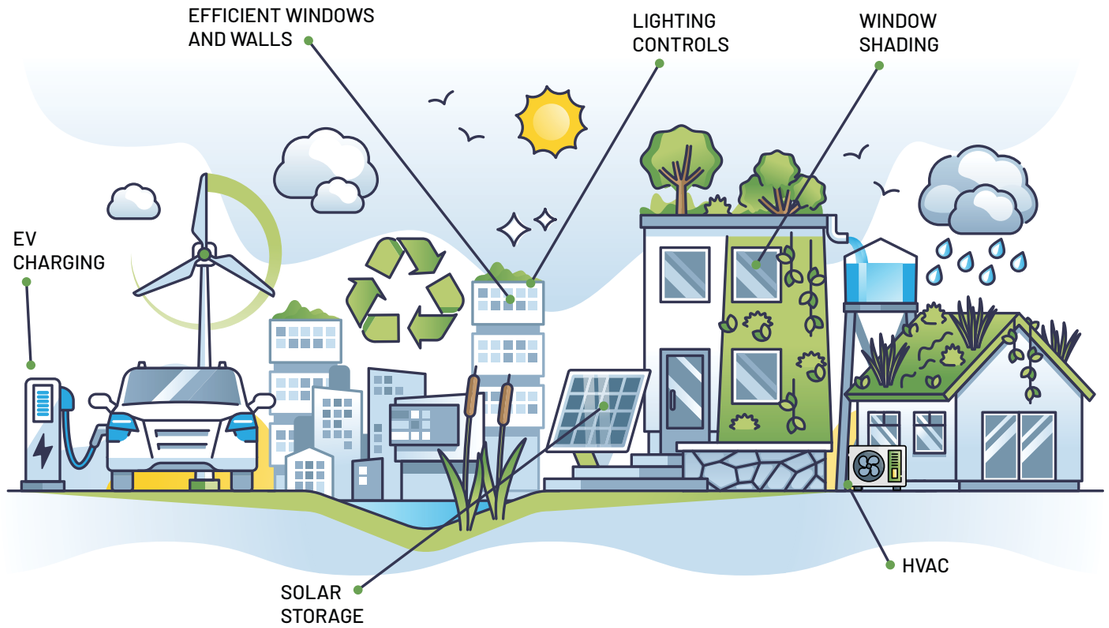
STEPS FORWARD

Using the data gathered from benchmarking and on-site energy assessments, CORE identified opportunities for improvement at each participating property. In August 2023, the City of Aspen and CORE distributed scorecards to property owners detailing their building's energy usage and providing recommendations on how to reduce it.

These changes have the potential to significantly decrease energy consumption in buildings, while also establishing a foundation for future building performance standards and policy initiatives.

THESE RECOMMENDATIONS INCLUDE:

- Transitioning to LED lighting.
- Tuning existing systems.
- Implementing automation for temperature control.
- Considering opportunities for electrification of heating systems.



Benchmarking serves as the foundation upon which the Building IQ program is constructed. This framework is evolving and it's imperative that each person, sector, and building actively contributes to the collective fight against climate change.

Benchmarked Building Highlight

Limelight Aspen is a 127,133-square-foot hotel featuring 126 guest rooms and suites, balancing elevated casual and unmatched hospitality with a dedicated commitment to sustainability. Limelight Aspen has been benchmarking since 2021 and was renovated to include a high-efficiency heating and cooling system that same year.

SOURCES

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Greenhouse Gases Equivalencies Calculator - Calculations and References. Greenhouse Gases Equivalencies Calculator - Environmental Protection Agency. (n.d.). https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

Residential Energy Consumption Survey (RECS) Dashboard. Experience. (n.d.). https://experience.arcgis.com/experience/cbf6875974554a74823232f84f563253?src=E2%80%B9+Consumption++++++Residential+Energy+Consumption+Survey+%28RECS%29-b1

What is energy use intensity (EUI)? ENERGY STAR. (n.d.). https://www.energystar.gov/buildings/benchmark/understand_metrics/what_eui

Coming Soon

-Building Performance Standards
-Advanced Benchmarking Software
-Increased Benchmarking Participation

Explore the full scope of Building IQ at AspenCORE.org.